REMARKS

This Amendment is fully responsive to the final Office Action mailed April 17, 2006 and is being enclosed with a Request for Continued Examination submitted concurrently herewith. Claims 24-30, 34-37, and 44-57 are pending. Claims 24-27, 30, 34-37, 44, 48, 49, and 53-57 are amended and claim 31 is being cancelled. Claims 32 and 33 are withdrawn from consideration. In view of the foregoing amendments, as well as the following remarks, Applicant respectfully submits that this application is in complete condition for allowance and requests reconsideration of the application in this regard.

Phone Interview

Applicant's undersigned representative appreciates the telephone interview granted by the Examiner on May 2, 2006. During the telephone interview, we discussed the relevance of the terms "active" and "passive" in the context of the presence or absence of a carrier gas. The Examiner suggested that the independent claims be amended to reduce, or eliminate, our reliance upon the term "passive." The Examiner also suggested that we amend the independent claims to set forth that the vapor phase reactant is provided from the receptacle to the main reaction chamber without the use of a carrier gas. Applicant has complied with these suggestions.

Rejections under 35 U.S.C. § 112

Claims 24-30 and 44-57 stand rejected under 35 U.S.C. § 112, First Paragraph as failing to comply with the written description requirement and under 35 U.S.C. § 112, Second Paragraph as being indefinite. Although Applicant does not agree with the rejections and for purposes of advancing prosecution without waiving the right to later traverse the rejections, Applicant has amended the claims so that any issues relating to the purported distinction between

the terms "actively" and "passively" is moot. Accordingly, Applicant requests that the Examiner withdraw the rejection.

Rejection under 35 U.S.C. § 102(e)

Claims 24-30, 34-37, and 44-57 stand rejected under 35 U.S.C. § 102(e) as anticipated by U.S. Patent No. 6,602,356, *Nagaraj et al.* (hereinafter *Nagaraj*) or, in the alternative, under 35 U.S.C. § 103(a) as obvious over *Nagaraj*. Of the rejected claims, claims 24, 34, 44 and 48 are the only independent claims. The Examiner contends that *Nagaraj* shows or teaches all the elements of the rejected claims. Applicant respectfully traverses the Examiner's contention.

In contrast to Applicant's independent claim 24, as amended, *Nagaraj* fails to disclose or suggest "heating the receptacle to form a first vapor phase reactant including a first extrinsic metal that is transported without assistance from a carrier gas from the receptacle to the main reaction chamber." Instead, column 4, lines 51-55 of *Nagaraj* discloses:

> An external generator 4 receiving a flow of gas from gas inlets 6 was used to produce aluminum trichloride gas using standard CVD processes well known in the art. A source of halide gas is introduced into the external generator that includes a source of aluminum. The generator is maintained at an elevated temperature by a heat source to allow for the formation of $AlCl_3$,[*sic* .]

It is readily apparent from this passage in *Nagaraj* that a halide gas is introduced into the external generator (4) as a carrier gas that reacts with a source of aluminum included in the external generator (4) to form aluminum trichloride gas.

Moreover, *Nagaraj* further discloses that the aluminum trichloride gas is flowed through an internal generator (8) characterized by multiple tubes (22). *See Nagaraj* at column 4, lines 55-65. Some of the tubes (22) are filled with hafnium chips. *See Nagaraj* at column 5,

lines 1-3. The aluminum trichloride operates as a carrier gas that reacts with the hafnium chips to form hafnium chloride gas and then assists in transporting the hafnium chloride gas to the reaction chamber (2). As mentioned above, the aluminum trichloride gas flowing through the empty tubes (22) is formed by a halide carrier gas and transported to the reaction chamber (2) with the assistance of the halide carrier gas. Furthermore, column 5, lines 21-24 of *Nagaraj* further discloses that an additional carrier gas of "hydrogen, helium, argon or nitrogen" is flowed with the aluminum trichloride gas through the open tubes (22).

In order for a reference to anticipate the invention in a claim, the reference must teach each and every element in the precise arrangement set forth in the claim. If the reference fails to teach even one of the claimed elements, the reference does not and cannot anticipate the claimed invention. *Nagaraj* fails to disclose a method of forming an aluminide coating that includes "heating the receptacle to form a first vapor phase reactant including a first extrinsic metal that is transported without assistance from a carrier gas from the receptacle to the main reaction chamber." Each of the vapor phase reactants disclosed in *Nagaraj* is formed and transported to the reaction chamber with the assistance of at least one carrier gas. For at least this reason, *Nagaraj* fails to anticipate independent claim 24. Therefore, Applicant respectfully requests that this rejection be withdrawn.

With regard to the alternative rejection of Applicant's independent claim 24, *Nagaraj* fails to provide any suggestion or motivation to modify the disclosed deposition method to correct its deficiencies and, moreover, to do so would be directly contrary to the required operational parameters of *Nagaraj*. *Nagaraj* requires a corrosive halide carrier gas that reacts with aluminum metal held inside the external generator (4) to form aluminum trichloride gas. The halide carrier gas then assists, along with an additional carrier gas consisting of hydrogen, helium, argon or nitrogen, with the transport of the aluminum trichloride gas through the non-

hafnium filled tubes (22) in internal generator (8) to the reaction chamber (2). If the halide carrier gas were eliminated, then aluminum trichloride gas could not be formed and transported to the reaction chamber (2). Any attempt to modify the disclosure in *Nagaraj* in this manner would render the external generator (4) unsatisfactory for its intended purpose and/or change the principle of operation of the external generator (4). Furthermore, *Nagaraj* fails to contain any express or implied suggestion that would lead a person having ordinary skill in the art to conclude that the aluminum trichloride gas could be formed and transported to the reaction chamber without the assistance of the halide carrier gas. Consequently, Applicant submits that the Examiner has failed to properly establish a case of *prima facie* obviousness to support the alternative rejection of independent claim 24. For at least this reason, Applicant requests that the rejection of independent claim 24 be withdrawn.

Nagaraj also requires an aluminum trichloride carrier gas that flows through the hafnium-filled tubes (22) of the internal generator (8) and reacts with the hafnium metal to form the hafnium chloride gas. The aluminum trichloride carrier gas then assists with the transport of the hafnium chloride gas to the reaction chamber (2). If the aluminum trichloride carrier gas were eliminated, then hafnium chloride gas could not be formed and transported to the reaction chamber (2). Any attempt to modify the internal generator (8) in *Nagaraj* in this manner would render the internal generator (8) unsatisfactory for its intended purpose and/or change the principle of operation of the internal generator (8). Furthermore, there is no express or implied suggestion in *Nagaraj* that would lead a person having ordinary skill in the art to conclude that the hafnium chloride gas could be formed and transported to the reaction chamber (2) without the assistance of aluminum trichloride carrier gas. Consequently, Applicant submits that the Examiner has failed to properly establish a case of *prima facie* obviousness to support the

alternative rejection of independent claim 24. For at least this additional reason, Applicant requests that the rejection of independent claim 24 be withdrawn.

Applicant submits that the Office Action fails to provide a sufficient motivation or suggestion to modify *Nagaraj* in the manner suggested in the Office Action. In contrast to the requirements of MPEP § 2143.01, the Office Action fails to offer any objective rationale to modify *Nagaraj* to eliminate the use of carrier gases, much less how to do so and still have an operating deposition system consistent with the operational parameters disclosed in *Nagaraj*. Instead, the Examiner is improperly using hindsight analysis based upon Applicant's disclosure as a source for a motivation or suggestion to make the suggested modifications to *Nagaraj*. Consequently, Applicant submits that the Examiner has failed to properly establish a case of *prima facie* obviousness to support the alternative rejection of independent claim 24. For at least this additional reason, Applicant requests that the rejection of independent claim 24 be withdrawn.

Because claims 25-30 depend from claim 24, Applicant submits these claims are also patentable for at least the same reasons as claim 24. Furthermore, these dependent claims recite unique combinations of elements not disclosed or suggested by *Nagaraj*.

Applicant's independent claims 34, 44, and 48, as amended, are patentable for at least the same or similar reasons as independent claim 24 in that each sets forth that the first vapor phase reactant is transported to the main reaction chamber without assistance of a separate flow of a carrier gas. With specific regard to independent claim 34, *Nagaraj* fails to disclose or suggest "transporting a first vapor phase reactant containing a first extrinsic metal to the main reaction chamber via a closed pathway from an external receptacle and without assistance of a separate flow of a carrier gas." With specific regard to independent claim 44, *Nagaraj* fails to

disclose or suggest "transporting the first vapor phase reactant to the deposition environment inside the main reaction chamber via a closed first communication path coupling the receptacle with the main reaction chamber while the heated jet engine component is in the main reaction chamber and without assistance of separate flow of a carrier gas." With specific regard to independent claim 48, *Nagaraj* fails to disclose or suggest "transporting the first vapor phase reactant from the receptacle to the deposition environment inside the main reaction chamber without assistance of a separate flow of a carrier gas from the receptacle to the main reaction chamber." For at least this reason, Applicant respectfully requests that the Examiner withdraw the rejection.

Because claims 35-37 depend from independent claim 34, claims 45-47 depend from independent claim 44, and claims 49-57 depend from independent claim 48, Applicant submits these claims are also patentable for at least the same reasons as claims 34, 44, and 48, respectively. Furthermore, these dependent claims recite unique combinations of elements not disclosed or suggested by *Nagaraj*.

Independent claim 48 is patentable for additional reasons. Specifically, *Nagaraj* fails to disclose or suggest "placing an amount of a metal-halogen Lewis acid material in a solid phase into the receptacle" and "heating the metal-halogen Lewis acid held in a receptacle external to the main reaction chamber to form a first vapor phase reactant including a first extrinsic metal." As discussed in the preceding remarks, *Nagaraj* discloses that the aluminum trichloride gas is formed by directing a halide carrier gas past aluminum metal. As also discussed in the preceding remarks, *Nagaraj* discloses that the hafnium chloride gas is formed by directing an aluminum trichloride carrier gas past hafnium metal. Consequently, *Nagaraj* fails to disclose or suggest that a solid phase metal-halogen Lewis acid could operate as the source of hafnium for the hafnium chloride gas or as a source of aluminum for the aluminum trichloride

gas. *Nagaraj* also fails to provide any suggestion or motivation to modify the disclosed deposition method to replace either the aluminum metal or the hafnium metal with a metal-halogen Lewis acid. Accordingly, independent claim 48 and its dependent claims 49-57 are patentable over the disclosure in *Nagaraj* for at least these additional reasons. Therefore, Applicant respectfully requests that the Examiner withdraw the rejection.

Conclusion

Applicant has made a bona fide effort to respond to each and every requirement set forth in the Office Action. In view of the foregoing amendments and remarks, this application is submitted to be in complete condition for allowance and, accordingly, a timely notice of allowance to this effect is earnestly solicited. In the event that any issues remain outstanding, the Examiner is invited to contact the undersigned to expedite issuance of this application.

Applicant does not believe fees are dues in connection with filing this communication other than the fee for the Request for Continued Examination. If, however, any additional fees are necessary as a result of this communication, the Commissioner is hereby authorized to charge any under-payment or fees associated with this communication or credit any over-payment to Deposit Account No. 23-3000.

Respectfully submitted,
WOOD, HERRON & EVANS, L.L.P.

/William R. Allen/
William R. Allen, Reg. No. 48,389

2700 Carew Tower
441 Vine Street
Cincinnati, OH 45202
(513) 241-2324